



Complete Summary

TITLE

Acute myocardial infarction: percent of patients with LVSD who are prescribed an ACEI or ARB at hospital discharge.

SOURCE(S)

Specifications manual for national hospital inpatient quality measures, version 3.0c. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct 1. various p.

Measure Domain

PRIMARY MEASURE DOMAIN

Process

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the [Measure Validity](#) page.

SECONDARY MEASURE DOMAIN

Does not apply to this measure

Brief Abstract

DESCRIPTION

This measure is used to assess the percent of acute myocardial infarction (AMI) patients with left ventricular systolic dysfunction (LVSD) who are prescribed an angiotensin converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) at hospital discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular systolic (LVS) function consistent with moderate or severe systolic dysfunction.

RATIONALE

Angiotensin converting enzyme inhibitor (ACEI) therapy reduces mortality and morbidity in patients with left ventricular systolic dysfunction (LVSD) after acute myocardial infarction (AMI) (Flather, 2000; Pfeffer, 1992; Torp-Peterson, 1999; and Yusuf, 1992). Recent clinical trials have also established angiotensin receptor

blocker (ARB) therapy as an acceptable alternative to ACEI, especially in patients with heart failure and/or LVSD who are ACEI intolerant (Granger, 2003 and Pfeffer, 2003). National guidelines strongly recommend ACEI for patients hospitalized with AMI who have either clinical heart failure or LVSD (Antman, 2004). Guideline committees have also supported inclusion of ARBs in performance measures for AMI (Antman, 2004). Despite these recommendations, ACEIs remain underutilized in eligible older patients hospitalized with AMI (Jencks, 2000).

PRIMARY CLINICAL COMPONENT

Acute myocardial infarction (AMI); left ventricular systolic dysfunction (LVSD); angiotensin converting enzyme inhibitor (ACEI); angiotensin receptor blocker (ARB)

DENOMINATOR DESCRIPTION

Acute myocardial infarction (AMI) patients with left ventricular systolic dysfunction (LVSD) (see the related "Denominator Inclusions/Exclusions" field in the Complete Summary)

NUMERATOR DESCRIPTION

Acute myocardial infarction (AMI) patients who are prescribed an angiotensin converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) at hospital discharge

Evidence Supporting the Measure

EVIDENCE SUPPORTING THE CRITERION OF QUALITY

- A clinical practice guideline or other peer-reviewed synthesis of the clinical evidence
- One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

NATIONAL GUIDELINE CLEARINGHOUSE LINK

- [ACC/AHA 2007 guidelines for the management of patients with unstable angina/non ST-Elevation myocardial infarction.](#)
- [\(1\) ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines \(Committee to revise the 1999 guidelines for the Management of Acute Myocardial Infarction\). \(2\) 2007 focused update of the ACC/AHA 2004 guidelines for the management of patients with ST-elevation myocardial infarction. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines.](#)

NEED FOR THE MEASURE

Use of this measure to improve performance

EVIDENCE SUPPORTING NEED FOR THE MEASURE

Anderson JL, Adams CD, Antman EM, Bridges CR, Califf RM, Casey DE Jr, Chavey WE 2nd, Fesmire FM, Hochman JS, Levin TN, Lincoff AM, Peterson ED, Theroux P, Wenger NK, Wright RS, Smith SC Jr, Jacobs AK, Adams CD, Anderson JL, Antman EM, Halperin JL, Hunt SA, Krumholz HM, Kushner FG, Lytle BW, Nishimura R, Ornato JP, Page RL, Riegel B, American College of Cardiology, American Heart Association Task Force on Practice Guidelines (Writing Committee, American College of Emergency Physicians, Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, American Association of Cardiovascular and Pulmonary Rehabilitation, Society for Academic Emergency Medicine. ACC/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-Elevation myocardial infarction: a report of the American College of Cardiology. *J Am Coll Cardiol* 2007 Aug 14;50(7):e1-e157. [957 references] [PubMed](#)

Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, Hochman JS, Krumholz HM, Kushner FG, Lamas GA, Mullany CJ, Ornato JP, Pearle DL, Sloan MA, Smith SC Jr. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction. A report of the Am Coll of Cardiol/Am Heart Assoc Task Force on Practice Guidelines (Committee to revise the 1999 guidelines). Bethesda (MD): American College of Cardiology, American Heart Association; 2004. 211 p. [1398 references]

Flather MD, Yusuf S, Kober L, Pfeffer M, Hall A, Murray G, Torp-Pedersen C, Ball S, Pogue J, Moye L, Braunwald E. Long-term ACE-inhibitor therapy in patients with heart failure or left-ventricular dysfunction: a systematic overview of data from individual patients. ACE-Inhibitor Myocardial Infarction Collaborative Group. *Lancet* 2000 May 6;355(9215):1575-81. [PubMed](#)

Granger CB, McMurray JJ, Yusuf S, Held P, Michelson EL, Olofsson B, Ostergren J, Pfeffer MA, Swedberg K. Effects of candesartan in patients with chronic heart failure and reduced left-ventricular systolic function intolerant to angiotensin-converting-enzyme inhibitors: the CHARM-Alternative trial. *Lancet* 2003 Sep 6;362(9386):772-6. [PubMed](#)

Jencks SF, Cuerdon T, Burwen DR, Fleming B, Houck PM, Kussmaul AE, Nilasena DS, Ordian DL, Arday DR. Quality of medical care delivered to Medicare beneficiaries: A profile at state and national levels. *JAMA* 2000 Oct 4;284(13):1670-6. [PubMed](#)

Krumholz HM, Anderson JL, Brooks NH, Fesmire FM, Lambrew CT, Landrum MB, Weaver WD, Whyte J, Bonow RO, Bennett SJ, Burke G, Eagle KA, Linderbaum J, Masoudi FA, Normand SL, Pina IL, Radford MJ, Rumsfeld JS, Ritchie JL, Spertus JA, American College of Cardiology, American Heart Association Task Force on

Performance Measures, Writing Committee to Develop Performance Measures on ST-Elevation and non ST-Elevation MI. ACC/AHA clinical performance measures for adults with ST-elevation and non ST-elevation myocardial infarction. J Am Coll Cardiol 2006 Jan 3;47(1):236-65. [PubMed](#)

Pfeffer MA, Braunwald E, Moya LA, Basta L, Brown EJ Jr, Cuddy TE, Davis BR, Geltman EM, Goldman S, Flaker GC, et al. Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction. Results of the survival and ventricular enlargement trial. The SAVE Investigators. N Engl J Med 1992 Sep 3;327(10):669-77. [PubMed](#)

Pfeffer MA, McMurray JJ, Velazquez EJ, Rouleau JL, Kober L, Maggioni AP, Solomon SD, Swedberg K, Van de Werf F, White H, Leimberger JD, Henis M, Edwards S, Zelenkofske S, Sellers MA, Califf RM. Valsartan, captopril, or both in myocardial infarction complicated by heart failure, left ventricular dysfunction, or both. N Engl J Med 2003 Nov 13;349(20):1893-906. [PubMed](#)

Torp-Pedersen C, Kober L. Effect of ACE inhibitor trandolapril on life expectancy of patients with reduced left-ventricular function after acute myocardial infarction. TRACE Study Group. Trandolapril Cardiac Evaluation. Lancet 1999 Jul 3;354(9172):9-12. [PubMed](#)

Yusuf S, Pepine CJ, Garces C, Pouleur H, Salem D, Kostis J, Benedict C, Rousseau M, Bourassa M, Pitt B. Effect of enalapril on myocardial infarction and unstable angina in patients with low ejection fractions. Lancet 1992 Nov 14;340(8829):1173-8. [PubMed](#)

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Accreditation
Collaborative inter-organizational quality improvement
External oversight/Medicaid
External oversight/Medicare
Internal quality improvement
National reporting
Pay-for-performance

Application of Measure in its Current Use

CARE SETTING

Hospitals

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Measure is not provider specific

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Single Health Care Delivery Organizations

TARGET POPULATION AGE

Age greater than or equal to 18 years

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

Each year 900,000 people in the United States (U.S.) are diagnosed with acute myocardial infarction (AMI); of these, approximately 225,000 cases result in death, and it is estimated that an additional 125,000 patients die before obtaining medical care.

EVIDENCE FOR INCIDENCE/PREVALENCE

American College of Cardiology, American Heart Association Task Force on Practice Guidelines, Committee on Management of Acute Myocardial Infarction. Ryan TJ, Antman EM, Brooks NH, Califf RM, Hillis LD, Hiratzka LF, Rapaport E, Riegel B, Russell RO, Smith EE III, Weaver WD. ACC/AHA guidelines for the management of patients with acute myocardial infarction: 1999 Update. Bethesda (MD): American College of Cardiology (ACC), American Heart Association (AHA); 1999. Various p.

ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

BURDEN OF ILLNESS

Cardiovascular disease, including acute myocardial infarction (AMI), is the leading cause of death in the United States (U.S.).

See also the "Incidence/Prevalence" field.

EVIDENCE FOR BURDEN OF ILLNESS

French WJ. Trends in acute myocardial infarction management: use of the National Registry of Myocardial Infarction in quality improvement. Am J Cardiol 2000 Mar 9;85(5A):5B-9B; discussion 10B-12B. [PubMed](#)

UTILIZATION

Cardiovascular disease, including acute myocardial infarction (AMI), is the primary disease category for hospital patient discharges.

EVIDENCE FOR UTILIZATION

French WJ. Trends in acute myocardial infarction management: use of the National Registry of Myocardial Infarction in quality improvement. Am J Cardiol 2000 Mar 9;85(5A):5B-9B; discussion 10B-12B. [PubMed](#)

COSTS

Unspecified

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness

Data Collection for the Measure

CASE FINDING

Users of care only

DESCRIPTION OF CASE FINDING

Discharges, 18 years of age and older, with a principal diagnosis of acute myocardial infarction (AMI) with left ventricular systolic dysfunction (LVSD)

DENOMINATOR SAMPLING FRAME

Patients associated with provider

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions

Discharges, 18 years of age and older, with an International Classification of

Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Principal Diagnosis Code for acute myocardial infarction (AMI) as defined in Appendix A, Table 1.1, of the original measure documentation *and* chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular systolic (LVS) function consistent with moderate or severe systolic dysfunction

Exclusions

- Patients less than 18 years of age
- Patients who have a Length of Stay (LOS) greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients discharged/transferred to another hospital for inpatient care
- Patients who left against medical advice or discontinued care
- Patients who expired
- Patients discharged/transferred to a federal health care facility
- Patients discharged/transferred to hospice
- Patients with a documented *Reason for No ACEI and No ARB at Discharge*

RELATIONSHIP OF DENOMINATOR TO NUMERATOR

All cases in the denominator are equally eligible to appear in the numerator

DENOMINATOR (INDEX) EVENT

Clinical Condition
Institutionalization

DENOMINATOR TIME WINDOW

Time window brackets index event

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions

Acute myocardial infarction (AMI) patients who are prescribed an angiotensin converting enzyme inhibitor (ACEI) or an angiotensin receptor blocker (ARB) at hospital discharge

Exclusions

None

MEASURE RESULTS UNDER CONTROL OF HEALTH CARE PROFESSIONALS, ORGANIZATIONS AND/OR POLICYMAKERS

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

NUMERATOR TIME WINDOW

Institutionalization

DATA SOURCE

Administrative data
Medical record

LEVEL OF DETERMINATION OF QUALITY

Individual Case

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Rate

INTERPRETATION OF SCORE

Better quality is associated with a higher score

ALLOWANCE FOR PATIENT FACTORS

Unspecified

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends
Internal time comparison

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

The core measure pilot project was a collaboration among The Joint Commission, five state hospitals associations, five measurement systems, and 83 hospitals from across nine states. Participating hospitals collected and reported data for acute myocardial infarction (AMI) measures from December 2000 to December 2001.

Core measure reliability visits were completed the summer of 2001 at a random sample of 16 participating hospitals across 6 states.

Preliminary data gathered from the pilot project shows a mean measure rate of 83% indicating an opportunity for improvement.

EVIDENCE FOR RELIABILITY/VALIDITY TESTING

The Joint Commission. A comprehensive review of development and testing for national implementation of hospital core measures. Oakbrook Terrace (IL): The Joint Commission; 40 p.

Identifying Information

ORIGINAL TITLE

AMI-3: ACEI or ARB for LVSD.

MEASURE COLLECTION

[National Hospital Inpatient Quality Measures](#)

MEASURE SET NAME

[Acute Myocardial Infarction](#)

SUBMITTER

Centers for Medicare & Medicaid Services
Joint Commission, The

DEVELOPER

Centers for Medicare & Medicaid Services/The Joint Commission

FUNDING SOURCE(S)

All external funding for measure development has been received and used in full compliance with The Joint Commission's Corporate Sponsorship policies, which are available upon written request to The Joint Commission.

COMPOSITION OF THE GROUP THAT DEVELOPED THE MEASURE

The composition of the group that developed the measure is available at:
<http://www.jointcommission.org/NR/rdonlyres/40EDE16E-0ECC-45E0-8CEC-71C97FF515D0/0/CardiovascularConditionsClinicalAdvisoryPanel.pdf>.

FINANCIAL DISCLOSURES/OTHER POTENTIAL CONFLICTS OF INTEREST

Expert panel members have made full disclosure of relevant financial and conflict of interest information in accordance with the Conflict of Interest policies, copies

of which are available upon written request to The Joint Commission and the Centers for Medicare & Medicaid Services.

ENDORSER

National Quality Forum

INCLUDED IN

Hospital Compare
Hospital Quality Alliance

ADAPTATION

Measure was not adapted from another source.

RELEASE DATE

2000 Aug

REVISION DATE

2009 Oct

MEASURE STATUS

This is the current release of the measure.

This measure updates a previous version: Specifications manual for national hospital quality measures, version 2.6b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2008 Oct. various p.

SOURCE(S)

Specifications manual for national hospital inpatient quality measures, version 3.0c. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; 2009 Oct 1. various p.

MEASURE AVAILABILITY

The individual measure, "AMI-3: ACEI or ARB for LVSD," is published in "Specifications Manual for National Hospital Inpatient Quality Measures." This document is available from [The Joint Commission Web site](#). Information is also available from the [Centers for Medicare & Medicaid Services \(CMS\) Web site](#). Check The Joint Commission Web site and CMS Web site regularly for the most recent version of the specifications manual and for the applicable dates of discharge.

COMPANION DOCUMENTS

The following are available:

- A software application designed for the collection and analysis of quality improvement data, the CMS Abstraction and Reporting Tool (CART), is available from the [CMS CART Web site](#). Supporting documentation is also available. For more information, e-mail CMS PROINQUIRIES at proinquiries@cms.hhs.gov.
- The Joint Commission. A comprehensive review of development and testing for national implementation of hospital core measures. Oakbrook Terrace (IL): The Joint Commission; 40 p. This document is available from [The Joint Commission Web site](#).
- The Joint Commission. Attributes of core performance measures and associated evaluation criteria. Oakbrook Terrace (IL): The Joint Commission; 5 p. This document is available from [The Joint Commission Web site](#).
- Hospital compare: a quality tool provided by Medicare. [internet]. Washington (DC): U.S. Department of Health and Human Services; 2009 Oct 5; [accessed 2009 Oct 12]. This is available from the [Medicare Web site](#). See the related [QualityTools](#) summary.

NQMC STATUS

This NQMC summary was originally completed by ECRI on February 7, 2003. This NQMC summary was updated by ECRI Institute on October 6, 2005, April 16, 2007, and October 26, 2007. The Joint Commission informed NQMC that this measure was updated on August 13, 2008 and provided an updated version of the NQMC summary. This NQMC summary was updated accordingly by ECRI Institute on November 11, 2008. The information was verified by the Centers for Medicare & Medicaid Services on January 22, 2009. The Joint Commission informed NQMC that this measure was updated again on October 1, 2009 and provided an updated version of the NQMC summary. This NQMC summary was updated accordingly by ECRI Institute on November 25, 2009. The information was verified by the Centers for Medicare & Medicaid Services on February 18, 2010.

COPYRIGHT STATEMENT

The Specifications Manual for National Hospital Inpatient Quality Measures [Version 3.0b, October, 2009] is the collaborative work of the Centers for Medicare & Medicaid Services and The Joint Commission. The Specifications Manual is periodically updated by the Centers for Medicare & Medicaid Services and The Joint Commission. Users of the Specifications Manual for National Hospital Inpatient Quality Measures should periodically verify that the most up-to-date version is being utilized.

Disclaimer

NQMC DISCLAIMER

The National Quality Measures Clearinghouse™ (NQMC) does not develop, produce, approve, or endorse the measures represented on this site.

All measures summarized by NQMC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public and private organizations, other government agencies, health care organizations or plans, individuals, and similar entities.

Measures represented on the NQMC Web site are submitted by measure developers, and are screened solely to determine that they meet the NQMC Inclusion Criteria which may be found at <http://www.qualitymeasures.ahrq.gov/about/inclusion.aspx>.

NQMC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or its reliability and/or validity of the quality measures and related materials represented on this site. The inclusion or hosting of measures in NQMC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding measure content are directed to contact the measure developer.

[Copyright/Permission Requests](#)

Date Modified: 3/15/2010

